م	ICA	NL.	ΙT	енв	LIST

PROJECT, SENS ASS'T MEMENCEATURE: BERVO'S

SYSTEM: ELECTRICAL SUBSYSTEM ASS'Y PARE STROFTTY

BARE, OTT, E PATILUTE HODE TAILURE EFFECT HOUR 7 TUNC. BEV. DRAUING BLE. AND DESIGNATION CAUSE RATIONALE FOR ACCEPTANCE END TIEM CRITICALITY 2990 0 EURRENE HODE: CURRENT DESIGN FEATURES EIMITER LOSS OF LIMITING WILL **SCHEMATIC** CURRENT BE INOPERALIVE. 2563718 SENSOR HOA BITE VILL ALL RESISTORS AND CAPACITORS USED IN THE DESIGN ARE SELECTED CINCUIT. DE INOPERATIVE. FROM ESTABLISHED RELEABILITY (ER) TYPES, LIFE EXPECTANCY IS MOTOR TORQUE INCREASED BY ENSURING THAT ALL ALLOWABLE STRESS LEVELS ARE DERATED IN ACCORDANCE WITH SPAR RMS PA.003. ALL CERAMIC AND CAUSE(\$): MAT BE UP TO (1) PARIS MAKEMIM ELECTROLYTIC CAPACITORS ARE ROUTENELY SUBJECTED TO FAILURE. POSSIBLE LEVEL. RADIOGRAPHIC INSPECTION. CONSISTENCY (2) FAILURE CHECK WILL COMPARATORS AND OPERATIONAL AMPLIFIERS ARE STANDARD LINEAR INTEGRATED CIRCUITS WITH MATURE MANUFACTURING TECHNOLOGY. OF PHASE NOT WORK SENSITIVE FOR CERTAIN APPLICATION CONSTRAINTS ARE IN ACCORDANCE WITH DETECTOR CLA FAILURES. SPAR-RHS-PA.003. FAILS S/C FUD/BKD FLAG U168 FALLURE DEPENDENT ONLY THE DESIGN UTILIZES PROVEN CIRCUIT TECHNIQUES AND IS UIGO FATLURE OH HOTOR IMPLEMENTED USING CHOS LOGIC DEVICES. UIB FAILS DIRECTION 0/C. EXCEPT WHEN IN CHOS DEVICES OPERATE AT LOW POWER AND NENCE DO NOT EXPERIENCE TEST MODE AND SIGNIFICANT OPERATING STRESSES. THE TECHNOLOGY IS MATURE AND DEVICE RELIABILITY HISTORY IS WELL DOCUMENTED. ALL STRESSES DURING EE CAPTURE SEQ ARE ADDITIONALLY REDUCED BY DERATING THE APPROPRIATE WHERE ONLY PARAMETERS IN ACCORDANCE WITH SPAR-RNS-PA.003. SPECIAL BACKDRIVE IS HANDLING PRECAUTIONS ARE USED AT ALL STAGES OF MANUFACTURE TO INDICATED. PRECLUDE DAMAGE/STRESS DUE TO ELECTROSTATIC DISCHARGE. **JOINT RUNAWAY** MAY OCCUR IN TEST HODE AND DURTHG EE CAPTURE SEQUENCE. WORST CASE UNEXPECTED HOTTON, JOHNT RUNAWAY. UNANHUNCIATED. CREW ACTION REQUIRED. REDUNDANT PATHS REMAINING N/A

PREPARED BY: MENG

SUPERCEDING DATE: 11 SFP 86

APPROVED BY:

DATE: _____

CRITICAL ITEMS LIST

PROJECT: SAMS ASS'Y NOMENCIATURE: <u>SERVO POWER AMPLIFIER</u>

SYSTEM: ELECTRICAL SUBSYSTEM ASS'Y P/N: 51740F1777

	DRAWING REF.	AND CAUSE	ON END ITEM	CALLICALITY RATIONALE FOR ACCEPTANCE
2990 0	CURRENT LIMITER SCHEMATIC 2563718	MODE: LOSS OF CURRENT SENSOR CIRCUIT. CAUSE(S): (1) PARTS FAILURE OF PHASE SENSITIVE DETECTOR CAG FAILURE U160 FAILURE U160 FAILURE U180 FAILURE O/C.	CURRENT LIMITING WILL BE INOPERATIVE. MDA BETE WILL BE INOPERATIVE. HOFER TOROUE HAY BE UP TO MANIMUM POSSIBLE LEVEL. CONSISTENCY CHECK WILL HOT WORK FOR CERTAIN FATLURES. FUD/BKO FEAG DEPENDENT ONLY ON MOTOR DERECTION, EXCEPT WHEN IN TEST MODE AND DURING EE CAPTURE ESC WHERE ONLY BACKDRIVE IS INDICATED. JOINT RUMAWAY MAY OCCUR IN TEST MODE AND OURING EE CAPTURE SEQUENCE. WORST CASE WHENECTED HOTION, JOINT RUMAWAY WAY OCCUR IN TEST MODE AND OURING EE CAPTURE SEQUENCE. WORST CASE WHENECTED HOTION, JOINT RUMAWAY LINANNUNCIATED. CREW ACTION REQUIRED.	CRITICALITY ACCEPTANCE TESTS THE SPA IS SUBJECTED TO THE FOLLOWING ENVIRONMENTAL TESTING AS AN SRU. O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 4 D THERHAL: PLUS 70 DEGREES C TO -25 DEGREES C DURATION 1 1/2 CYCLES THE SPA IS THEN TESTED AS PART OF THE JOINTS ACCEPTANCE TESTS (VIBRATION AND THERMAL VACUUM TEST). THE SPA'S/JOINTS UNDERGO RMS SYSTEM TESTS (TPST8 RMS STRONGBACK AND TPSS2 FLAT FLOOR TESTS) WHICH VERTITES THE ASSENCE OF THE FAILURE MODE. QUALIFICATION TESTS THE SPA IS SUBJECTED TO THE FOLLOWING SRU QUALIFICATION TEST ENVIRONMENTS. THE SPA WAS ALSO TESTED AS PART OF THE JOINT QUALIFICATION TESTS. O VIBRATION: LEVEL AND DURATION - REFERENCE TABLE 4 O SHOCK: 20G/11 MS/3 AKES (4 DIRECTIONS) O THERMAL VAC: 81 DEGREES C TO -36 DEGREES C (6 CYCLES) INTO-6 TORM O HUMIDITY: TESTED WITH THE SMOULDER JOINT O ENC: NIL-SID-661 AS MODIFIED BY SL-E-0002 (TEST CEOT, CEOT, CEOT, CEOT, CSO6, REDT, REDZ (H/B), RSOT) FLIGHT CHECKOUIT PDRS OPS CHECKLIST (ALL VEHICLES) JSC 16987

PREPARED BY: HENG

SUPERCEDING DATE: 11 SEP 86

APPROVED BY:

FICAL ITEMS LIST

PROJECT: SRMS ASS'Y NOHENCLATURE: SERVO PO MALTER

SYSIEM: ELECTRICAL SUBSYSIEM ASS'Y P/N: STEUFTTY

THEX NAME, OTT. & TATIURE HODE SHEET: ____3 FAILURE EFFECT REF. REV. TIDUR 7 TUNE. DRAWING REF. AND OM DESIGNATION CAUSE RATIONALE FOR ACCEPTANCE END ITEM CRITICALITY 2990 0 CURRENT MODE: CURRENT LIMITER QA/INSPECTIONS LOSS OF LIMITING VILL SCHEMATIC CURRENT BE INOPERALIVE. 2563718 SENSOR HOA BITE WILL UNITS ARE HANDFACTURED UNDER DOCUMENTED QUALITY CONTROLS. CIRCUIT. BE INOPERATIVE. THESE CONTROLS ARE ENERGISED THROUGHOUT DESIGN PROCUREMENT, PLANNING, RECEIVING, PROCESSING, FABRICATION, ASSEMBLY, TESTING AND SHIPPING OF THE UNITS, MANDATORY HOTOR TORQUÉ CAUSE(S): MAY BE UP TO (1) PARÍS MAKIMAN INSPECTION POINTS ARE EMPLOYED AT VARIOUS STAGES OF fAILURE. POSSIBLE LEVEL. FABRICATION ASSEMBLY AND TEST. GOVERNMENT SOURCE CONSISTENCY INSPECTION IS INVOKED AT VARIOUS CONTROL LEVELS. (2) FAILURE CHECK WILL OF PHASE EEE PARTS INSPECTION IS PERFORMED AS REQUIRED BY SPAR-AMS-PA.ODJ. EACH EEE PART IS QUALIFIED AT THE PART LEVEL TO THE REQUIREMENTS OF THE APPLICABLE SPECIFICATION. ALL EEE NOT WORK SENSITIVE FOR CERTAIN DETECTOR CAS FAILURES. FAILS S/C PARTS ARE 100% SCREENED AND BURNED IN, AS A MINIMUM, AS RECUIRED BY SPAR-RMS-PA.003, BY THE SUPPLIER. ADDITIONALLY, EEE PARTS ARE 100% RE-SCREENED IN ACCORDANCE WITH FUD/BKD FLAG UIGO FAILURE DEPENDENT ONLY U160 FAILURE ROTON NO UIB FAILS DIRECTION FACILITY. OPA IS PERFORMED AS REQUIRED BY PA. 003 ON A RANDONLY 0/C. EXCEPT WHEN TH TEST HODE AND SELECTED SX OF PARTS, MAXIMUM 5 PIECES, MINIMUM 3 PIECES FOR EACH LOT HUMBER/DATE CODE OF PARTS RECEIVED. OURING EE CAPTURE SEO WHERE ONLY VIRE IS PROCURED TO SPECIFICATION HIL-U-22759 OR HIL-U-81381 BACKDAIVE IS AND INSPECTED AND TESTED TO MASA JSCHOOL STANDARD NUMBER 95A. INDICATEO. JOINT RUNAWAY RECEIVING INSPECTION VERIFIES THAT ALL PARTS RECEIVED ARE AS DAMAGE HAS OCCURRED TO PARTS DURING SHIPMENT, THAT HO PHYSICAL DAMAGE HAS OCCURRED TO PARTS DURING SHIPMENT, THAT THE MAY OCCUR IN JEST HODE AND DURING EE RECEIVING DOCUMENTS PROVIDE ADEQUATE TRACEASILITY INFORMATION CAPIURE AND SCREENING DATA CLEARLY IDENTIFIES ACCEPTABLE PARTS. SEQUENCE. PARTS ARE INSPECTED THROUGHOUT NAMUFACTURE AND ASSEMBLY AS APPROPRIATE TO THE MANUFACTURING STAGE COMPLETED. THESE WORST CASE INSPECTIONS INCLUDE. UNEXPECTED HOTION, JOINT PRINTED CIRCUIT BOARD INSPECTION FOR TRACK SEPARATION, DAMAGE RUWAWAY AND ADEQUACY OF PLATED THROUGH HOLES, UNANNUNCIATED. COMPONENT MOUNTING INSPECTION FOR CORRECT SOLDERING, WIRE LOOPING, STRAPPING, ETC. OPERATORS AND INSPECTORS ARE FRAINED AND CERTIFIED TO MASA NHB 5300.4(3A) STANDARD, AS MODIFIED CREW ACTION RECUIRED. REDUNDANT PATHS REMAINING CONFORMAL COATING INSPECTION FOR ADEQUATE PROCESSING IS PERFORMED USING ULIRAVIOLET LIGHT TECHNIQUES. N/A POST P.C. BD. INSTALLATION INSPECTION, CLEANLINESS AND LORKMANSHIP (SPAR/GOVERNMENT REP. MANDATORY INSPECTION POINT) P.C. BD. INSTALLATION INSPECTION, CHECK FOR CORRECT BOARD INSTALLATION, ALIGNMENT OF BOARDS, PROPER CONNECTOR CONTACT MATING, WIRE ROUTING, STRAPPING OF WIRES ETC., PRE-CLOSURE INSPECTION, WORKMANSHIP AND CLEANLINESS (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT) PRE-ACCEPTANCE TEST INSPECTION, WHICH INCLUDES AN AUDIT OF LOWER TIER INSPECTION COMPLETION, AS BUILT CONFIGURATION VERIFICATION TO AS DESIGN ETC., (MANDATORY INSPECTION POINT)

PREPARED BY: NEWG

SIPERCEDING DATE: 11 SEP 86

APPROVED' BY:

DATE:

CRITICAL ITEMS LIST

PADJECT: SRMS ASS'Y NOMENCLATURE: SERVO POWER AMPLIFIER

STSTEM: ELECTRICAL SUBSYSTEM ASS'Y P/R: 5174071177 THEAT SHEET: FAITURE HODE FAILURE EFFECT HOUR 7 FUNC. AEF. REV. DRAWING REF. AND DESIGNATION RATIONALE FOR ACCEPTANCE CAUSE END TIEM CRITICALITY 2990 0 CURRENT : 300K CURRENT LIMITER LOSS OF A FEST READINESS REVIEW (TRR) WHICH INCLUDES VERIFICATION OF TEST PERSONNEL, TEST DOCUMENTS, TEST EQUIPMENT CALIBRATION/VALIDATION STATUS AND MADDIAGE CONFIGURATION IS CONVENED BY QUALITY ASSURANCE IN CONJUNCTION WITH ENGINEERING LINITING WILL SCHEMATIC CURRENT BE INOPERALIVE. 2563718 SENSOR HOA BITE WILL CIRCUIT. BE INOPERATIVE. HOTOR TOROUE COLLITE HOSDWAMLE IN LUMIUNCTION WITH ENGINEERING, CONTROL, SUPPLIER AS APPLICABLE, AND THE GOVENMENT REPRESENTATIVE, PRIOR TO THE START OF ANY FORMAL TESTING (ACCEPTANCE OR QUALIFICATION). CAUSE(\$): HAY BE UP TO (1) PĂŘÍŠ MANIFICAM FAILURE. POSSIBLE LEVEL. ACCEPIANCE TESTING (ATP) INCLUDES AMBIENT PERFORMANCE, THERNAL AND VIBRATION TESTING, (SPAR/GOVERNMENT REP. CONSISTENCY (2) FAILURE CHECK WILL OF PHASE NOT WORK MANDATORY INSPECTION POINT). SENSITIVE FOR CERTAIN DETECTOR C46 FAILURES. INTEGRATION OF UNIT TO JOINT SRU . INSPECTIONS INCLUDE JAILS S/C FUD/OKD FLAG GROUNDING CHECKS, CONNECTORS FOR BENT OR PUSHBACK UTOB FALLURE DEPENDENT ONLY CONTACTS, VISUAL, CLEANLINESS, INTERCONNECT MINING AND POWER UP TEST TO THE APPROPRIATE JOINT INSPECTION TEST PROCEDURE (11P) ETC. U160 FAILURE ON HOLOR DIRECTION U18 FAILS 0/C. EXCEPT WHEN IN TEST MODE AND DURING EE CAPTURE SEQ JOINT LEVEL ACCEPTANCE TESTING (ATP) INCLUDES AMBINET. VIBRATION AND THERMAL VAC TESTING. UHERE ONLY (SPAR/GOVERNMENT REP. - MANDATORY INSPECTION POINT). BACKDRIVE IS INDICATED. SRMS SYSTEMS INTEGRATION. THE INTEGRATION OF MECHANICAL ARM SUBASSEMBLIES AND THE FLIGHT CABIN EQUIPMENT TO FORM THE SRMS. JOINT RUNAWAY MAY OCCUR IN INSPECTIONS ARE PERFORMED AT EACH PHASE OF INTEGRATION WHICH TEST MODE AND DURING EE INCLUDES GROUNDING CHECKS, THRU WIRING CHECKS, WIRING ROUTING, INTERFACE CONNECTORS FOR BENT OR PUSH BACK CONTACTS ETC. CAPTURE SEQUENCE. SRMS SYSTEMS TESTING - STRONGBACK AND FLAT FLOOR AMBIENT PERFORMANCE TEST. (SPAR/GOVERNMENT REP. - MANDATORY INSPECTSON **WORST CASE** UNEXPECTED HOTTON, JOINT RUNAWAY. UNANNUNCIATED. CREW ACTION REQUIRED. REDUNDANT PATHS REMAINING W/A

PREPARED BY: MING

SUPERFEDING DATE: 11 SEP AA

APPROVED BY:

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PROJECT: SAMS ASS'Y NOMENCLATURE: SERVO PO

HPLIFIER SYSTEM: ELECTRICAL SUBSYSTEM
ASS'Y P/N: \$114071177

DATE:

SHEET:

MEY. REV.	DRAWING REF. DESIGNATION CAUS	FATEURE EFFECT ON END ITEM	HDUR 7 FUNC. 1/f RATIONALE FOR ACCEPTANCE CRIFFICALITY	
-	CURRENT LIMITER SCHEMATIC 2563718 CAUSE(8 (1) PAR FAILURE (2) FAII OF PHASI SENSITI DETECTO FAILS S, U168 FAI U160 FAI U160 FAI U160 FAI U160 FAI U160 FAI U160 FAI	MANTHUM POSSIBLE LEVEL CONSISTENCY CHECK WILL HOT MORK FOR CERTAIN FAILURES. FMO/BKD FLAG DEPENDENT ONLY UNE	THERE HAVE BEEN NO FAILURES ASSOCIATED WITH THIS FAILURE MODE ON THE SRMS PROGRAM.	

PREPARED ST: MENG SUPERCEDING DATE: 11 SEP 86 APPROVID BY:

CRITICAL ITEMS LIST

PROJECT: SRMS ASS'Y NOMENCLATURE: <u>SERVO POWER AMPLIFIER</u>

SYSTEM: ELECTRICAL SUBSYSTEM ASS'Y P/N: STYOFTIFF

DRAWING REF. TAILURE RIDE PAILURE EFFECT HOWA 7 FURC. REF. REV. DESIGNATION RATIONALE FOR ACCEPTANCE CAUSE END ITEM CRITICALITY 2990 0 **CURRENT** HODE: CURRENT OPERATIONAL EFFECTS LIMITER LOSS OF LIMITING WILL SCHEMATIC CUARENT BE INOPERATIVE. 2563718 SENSOR HOA BITE UTIL IN TEST MODE OR DURING EE CAPTURE/REGIDIZE SEQUENCE, JOINE CIRCUIT. BE INOPERATIVE. HAY RUNAWAY. ARM WILL NOT STOP AUTOMATICALLY AFTER SUBSEQUENT MOTOR TOROUT FAILURE (FMO/BKD FLAG DIRECTION ONLY). EMANHUNCIATED. CAUSE(S): MAY BE UP TO ALL OTHER JOINTS WILL BE IN LIMP CONDITION AND EXCESSIVE (1) PARÍS FAILURE. MAX INUM COADS WILL NOT BE APPLIED. PERFORM CAPTURE SEQUENCE WHEN NOT POSSIBLE LEVEL. IN COMPUTER SUPPORTED HODE. CONSISTENCY (2) FAILURE CHECK WILL CREW ACTION OF PHASE NOT WORK SENSITIVE FOR CERTAIN DETECTOR C46 FAILURES. APPLY BRAKES. FAILS S/C FHO/BKO FLAG UIGO TATLURE DEPENDENT ONLY CREW TRAINING UIGO FAILURE ON HOTOR UIB FAILS DIRECTION O/C. EXCEPT WHEN IN CREW WILL BE IRAINED TO OBSERVE WHETHER ARM IS RESPONDING CORRECTLY TO COMPANDS. IF IT ISN'T APPLY BRAKES. CREW WILL TEST HODE AND DURING EE CAPTURE SEQ BE TRAINED TO MINIMIZE ALIGNMENT ERRORS DURING CAPTURE OF PAYLOAD. WHERE CHLY **BACKDRIVE IS** INDICATED. **MISSION CONTRAINT** JOINT RUNAWAY MAY OCCUR IN TEST HODE AND DO NOT SELECT TEST MODE WITHIN 10 FT OF STRUCTURE. WHEN CAPIURING FACE FLYING PAYLOAD, THE EE MUST BE FAR ENOUGH AWAY FROM STRUCTURE TO PROHIBIT CONTACT REGARDLESS OF PAYLOAD **DURING EE** CAPTURE SEQUENCE. ROTATIONS. SELECT TEST MODE IMMEDIATELY PRIOR TO CAPTURENG PAYLOAD. WORST CASE SCREEN FAILURES UNEXPECTED HOTTON, JOINT RUNALIAY. N/A UNARHUNCIATED. CREW ACTION CHASD OFFLINE REQUIRED. IN COMPUTER CONTROLLED MODE REDUNDANT PATHS FOR EACH JOINE REMAINING VERIFY HO JOINT MOTION FOR ZERO CURRENT LIMIT SETTING MOSTALLATED THE THE TREE OF THE THE TREE OF THE TREE O NONE CHRSD ONE THE TURNARCHIND FOR EACH JOINT, IN 1651 HODE VERIFY NO TACHOHETER HOTTON

PREPARED BY: MENG

SUPERCEDING DATE: 11 SEP 86 ___

APPROVID BY: